

## **International Laser Ranging Service (ILRS) 2007-2008 Report Greenbelt, MD (NGSLR)**

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Figure 1. NGSLR staff: Tony Mallama, Tom Cuff, Loyal (Stu) Stewart, Tom Zagwodzki, Jack Cheek, Don Patterson, Jan McGarry, Jim Long, Mike Perry, Tony Mann, Renata Barski, Bud Donovan, John Hundertmark (left to right).

NGSLR advanced towards completion of its SLR capability during 2007 and 2008. The Risley Prism point-ahead of the transmit beam was successfully completed allowing the closure of the receiver field of view down to 11 arcseconds. This in turn made daylight ranging possible. Daylight ranging up to LAGEOS altitude became routine during this period. Improvements in the Pulse Repetition Frequency (PRF) control, the alignment technique, the beam expander, and a new I/O chassis allowed routine hands-off tracking of satellites from LEO to LAGEOS and easy ground calibration capability. Although the system's Q-Peak laser energy gradually decreased to less than 80 microJoules per pulse, the ability to set the laser divergence to 4 arcseconds, combined with very accurate predictions and arcsecond level mount control, gave the system the ability to track LAGEOS down to 20 degrees elevation and successfully track GLONASS.

Future efforts will concentrate on co-location of the system with MOBLAS-7 and completion of the automated closed-loop tracking.

During this period modifications to NGSLR for laser ranging to LRO were implemented. A 28 Hz, 50 milliJoule per pulse Northrop-Grumman laser was added to the system, along with a removable mirror to allow the system to use either the Q-Peak (2 kHz eyesafe SLR) or the Northrop-Grumman (LRO) laser. Since the new 28 Hz laser is not eyesafe an aircraft avoidance radar was also added to the system. Software and I/O chassis changes were also made to implement laser ranging to LRO.

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